REMARKS

Reconsideration of this application is respectfully requested.

In the Official Action, the Examiner rejects claims 1 and 7-9 under 35 U.S.C. § 103(a) as being unpatentable over Kokai Publication No. 4-329944 (hereinafter "Kokai") in view of U.S. Patent No. 4,943,290 to Rexroth, et al. (hereinafter "Rexroth"). Furthermore, the Examiner rejects claim 10 under 35 U.S.C. § 103(a) as being unpatentable over Kokai and Rexroth and further in view of U.S. Patent No. 5,846,241 to Kittur, et al. (hereinafter "Kittur").

In response, the Applicant respectfully traverses the Examiner's rejections under 35 U.S.C. §§ 102(b) and 103(a) for at least the reasons set forth below. However, independent claim 1 has been amended to clarify its distinguishing features. Specifically, independent claim 1 has been amended to recite:

> "an electrically insulative flexible sheath having only one flow channel inside, a distal end portion and a proximal end portion, the distal end portion of the sheath having a distal opening and an axis;
>
> a support member which closes the distal opening of the sheath, the support member having a slide hole with a diameter smaller than that of the distal opening extending along the axis thereof;
>
> an operating wire axially movable in the sheath;
>
> an electrode portion which has a distal end portion and a proximal end portion and of which at least a part forms a rod-shaped portion, the proximal end portion of the electrode portion being coupled to the operating wire, the rod-shaped portion being passed through the slide hole for axial projection and retraction;
>
> a control section which is provided on the proximal end portion of the sheath and controls the operating wire to project and retract the electrode portion in the axial direction, the control section having a high-frequency current supply portion which supplies a high-frequency current to the electrode portion;
>
> a liquid feed portion which is provided on the proximal end side of the sheath and feeds a liquid through the only one flow channel inside the sheath towards the distal opening; and

> a plurality of openings for liquid feed which are formed in the support member, the plurality of openings for liquid feed being arranged around and independently of the slide hole, communicating to the only one flow channel, and partially blocking flow of the liquid fed in the vicinity of the distal end portion by the liquid feed portion such that a cross sectional area of the plurality of openings for liquid feed is smaller than a cross sectional area of the only one flow channel."

The amendment to claim 1 is fully supported in the original disclosure, such as at Figures 1A and 1B of the Drawings illustrating that the total cross sectional area of the openings (e.g., 19) for liquid supply is smaller than the cross sectional area of the flow channel (e.g., 2a) of the sheath (e.g., 2) which is the only one flow path. Thus, no new matter has been introduced into the disclosure by way of the present amendment to independent claim 1.

The Applicant respectfully submits that Kokai does not even contemplate the concept of a liquid supply via an opening that is independent of a slide hole. Therefore, those of ordinary skill in the art would not consider incorporating the concept of providing a hole other than the slide hole for liquid supply in Rexroth to the stopper member of the Kokai.

Further, in Rexroth, the knife in the sheath is continuously supported by the support wall from the proximal end to the distal end. With this structure, it would not be possible to provide a stopper as disclosed in Kokai. As described above, it would also not be possible to incorporate the concept of a stopper to Rexroth. Thus, those of ordinary skill in the art would simply not look to either of Kokai and Rexroth to combine the same with the teachings of the other.

The Examiner points out that Rexroth states in Column 8, line 66 to Column 9, line 3 "... as well as providing a superior flow pattern of the non-conductive fluid at the second end 72 of the duct means 70 in proximity to the electrode tip." Based on the quoted

structure, the Examiner considers that if the support member (stopper member 4) of Kokai is modified with this teaching from Rexroth, a plurality of openings are connected to only one flow path.

However, the Applicant respectfully submits that the mere expression of "superior flow pattern," does not achieve the advantages of the radio knife of Claim 1. Namely, saline can be vigorously sprayed from a plurality of openings whose total cross sectional area is reduced from that of the only one flow path to wash a bleeding section. Rexroth merely discloses a plurality of opening portions without having any reduction in cross section in their flow path, which sprays liquid in the so-called, laminar flow state with no particular vigor. The term "superior flow pattern" is used in Rexroth only because the flow is in a laminar flow state, without turbulent flow or eddy current, but it flows neatly. As will be described below, the "superior flow pattern" described in Rexroth is entirely different from the characteristic flow pattern obtained by the radio knife of claim 1.

With regard to the flow created by the recited configuration of the radio knife of claim 1, in consideration of the continuity of fluid from the equation of the continuity of fluid, which is, in this case, applied to the fact that the volume of the fluid flows within the flow channel (e.g., internal space 2a) of the sheath (e.g., 2) must be equal to the volume of the flow which flows out of the plurality of openings, the flow speed of the saline in the flow channel, and the spray speed from the plurality of openings whose total cross sectional area is reduced are inversely proportional to the cross sectional areas of flow channel and plurality of openings, respectively.

By contrast, Rexroth shows in Figure 6, support walls 80 to 83 which form four channels 75 to 78, in which the cross sectional area of the openings of which does not

vary. That is, the support walls 80 to 83 are formed not only in the distal end section of the duct means 70 but along the entire length thereof to define the partitions. With this structure, in order to obtain a jet speed similar to that of the radio knife of claim 1, it is necessary to apply a very high pressure to increase the flow speed. However, while the apparatus being inserted to a body cavity of a patient are applied such a high pressure to obtain a desired flow speed, in this respect, it can be understood that the claimed radio knife is preferable in comparison with the device of Rexroth.

As described above, even if the support walls of Rexroth, which do not exhibit the advantageous effect discussed above and the "superior flow pattern" which suggests an entirely different meaning from that interpreted by the Examiner, can be properly combined with Kokai, the resulting structure would still not provide the advantageous effects of the radio knife of claim 1.

To further clarify the structure necessary to achieve such advantageous results, claim 1 recites the blocking function of the support member at the distal end of the sheath and is now further amended to recite that a cross sectional area of the plurality of openings for liquid feed is smaller than a cross sectional area of the only one flow channel.

None of the prior art references, alone or in any proper combination teach or such features or the advantages resulting therefrom.

With regard to the rejections of claims 1 and 7-9 under 35 U.S.C. § 103(a), independent claim 1, as amended, is not rendered obvious by the cited references because neither the Kokai application nor the Rexroth patent, whether taken alone or in combination, teach or suggest a radio knife having the features recited in independent claim 1. Accordingly, claim 1, as amended, patentably distinguishes over the prior art and is allowable.

Claims 7-9, being dependent upon claim 1, are thus at least allowable therewith. Consequently, the Examiner is respectfully requested to withdraw the rejections of claims 1 and 7-9 under 35 U.S.C. § 103(a).

With regard to the rejection of claim 10 under 35 U.S.C. § 103(a), since independent claim 1 patentably distinguishes over the prior art and is allowable, claim 10 is at least allowable therewith because it depends from an allowable base claim. Consequently, the Examiner is respectfully requested to withdraw the rejection of claim 10 under 35 U.S.C. § 103(a).

In view of the above, it is respectfully submitted that this application is in condition for allowance. Accordingly, it is respectfully requested that this application be allowed and a Notice of Allowance issued. If the Examiner believes that a telephone conference with Applicants' attorneys would be advantageous to the disposition of this case, the Examiner is requested to telephone the undersigned.

Respectfully submitted,

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